

Paleomagnetism of Tertiary sedimentary basins in the Yubari area: Implication for tectonic rotation in central Hokkaido

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Central Hokkaido is regarded as a zone of deformation characterized by right-lateral strike-slip movement during late Oligocene to middle Miocene (Kimura, 1983; Jolivet and Huchon, 1989). Because this tectonic phase would be synchronous formation of the Japan Sea, deformation and formation of basins in central Hokkaido may be linked to regional rearrangement of the eastern Eurasian.

In order to describe tectonic deformation of Tertiary sedimentary basins in central Hokkaido, we conducted a paleomagnetic study in the Yubari area where the Paleogene to early Miocene sediments are well exposed. Kurita & Yokoi (2000) suggested that the upper Oligocene to lower Miocene stratigraphic records in this area imply stepwise basin development from an incipient pull-apart basin under transtension tectonics in the late Oligocene to a foreland basin of a regional scale under transpression tectonics in the middle Miocene.

We collected samples from 6 sites in the late Eocene formation (Poronai Formation), 13 sites in the early Oligocene formation (Momijiyama Formation), 8 sites in the late Oligocene formation (Minaminaganuma Formation) and 2 sites in the late Early Miocene formation (Takinoue Formation). Age determination in these strata is on the basis of dinoflagellate cysts and diatoms (Kurita & Yokoi, 2000; Kurita & Matsuoka, 1994).

We present untilted paleomagnetic data obtained from these areas which are located on the western front deformation zone caused by collision of the Kurile Arc and the Tohoku Arc since late Oligocene (e.g. Kimura et al.,1983 and Ito et al.,1999). Remanent magnetization was measured for all specimens by a cryogenic magnetometer (2-G Enterprise model 760). In order to isolate stable remanent magnetization, progressive thermal demagnetization (PThD), and progressive alternating field demagnetization (PAFD) tests were carried out. Two or three specimens per one site (pilot specimens) which have average direction in natural remanent magnetization (NRM) were subjected to PAFD or PThD respectively. Characteristic components of pilot specimens obtained from the Poronai Formation showed reversal and westerly deflected magnetic direction, whereas those from the Minaminaganuma Formation showed normal and easterly deflected magnetic direction. These indicate that this area suffered clockwise tectonic rotation since Paleogene.